



(12)

## EUROPEAN PATENT APPLICATION

(43) Date of publication:

04.04.2001 Bulletin 2001/14

(51) Int. Cl. 7: H01P 1/203

(21) Application number: 00308030.6

(22) Date of filing: 15.09.2000

(84) Designated Contracting States:

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE

Designated Extension States:

AL LT LV MK RO SI

(30) Priority: 29.09.1999 JP 27662699

(71) Applicant:

KABUSHIKI KAISHA TOSHIBA  
Kawasaki-shi, Kanagawa-ken 210-8572 (JP)

(72) Inventors:

- Terashima, Yoshiaki  
Yokosuka-shi, Kanagawa-ken (JP)

- Fuke, Hiroyuki  
Kawasaki-shi, Kanagawa-ken (JP)
- Kayano, Hiroyuki  
Yokohama-shi, Kanagawa-ken (JP)
- Yoshino, Hisashi  
Machida-shi, Tokyo-to (JP)

(74) Representative:  
Granleese, Rhian Jane et al  
Marks & Clerk,  
57-60 Lincoln's Inn Fields  
London WC2A 3LS (GB)

## (54) Planar filter and filter system

(57) There is disclosed a planar filter which can variably control a pass frequency band with a high precision and which is superior in skirt property and little in ripple.

A planar filter member (1) and tuning member (2) are disposed opposite to each other via a predetermined gap. The filter member (1) is structured in such a manner that an input/output portion (5) formed of a superconductor and a plurality of resonance elements (6) are formed on a substrate (4). The tuning member (2) is structured in such a manner that on the surface of a magnetic plate (7) with a permeability changing by an applied magnetic field, a plurality of dielectric thin films (8), and a plurality of electrodes (9) for applying electric fields to the dielectric thin films (8) are arranged. Each of the dielectric thin films (8) is disposed in a position opposite to a gap between the resonance elements (6) of the filter member (1), or a gap between the filter member (1) and the input/output portion (5). By applying a voltage between the electrodes (9), an effective permittivity  $\epsilon$  of the gap between the resonance elements (6), or the gap between the resonance element (6) and the input/output portion (5) is variably controlled, and the skirt property and ripple are adjusted. Moreover, a resonance frequency of the resonance elements (6), and a coupling between the resonance elements (6), and a coupling between the resonance element (6) and the input/output portion (5) may be individually and independently controlled.

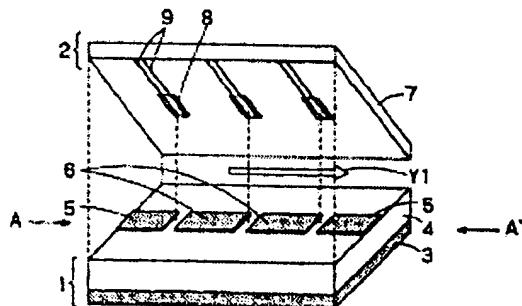


FIG. 1